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An Approach to the Concept of Tonic: Suggested Definitions and Historical Aspects

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Keywords

CAM · Herbal medicine · Herbal drug · Phytotherapy · Tonic

Summary

In traditional medicine, especially CAM, the concept of (herbal) tonics has a long history in the different medical systems (TEN – Traditional European Naturopathy; TCM – Traditional Chinese Medicine). Nevertheless, the ideas concerning the function of a tonic differ, e.g., stimulation of body functions, strengthening of organ function, enhancement of adaption, and well-being. Although no exact pharmacodynamic or pharmacokinetic properties of tonics can be given, the following general definition, even in the transcultural comparison between European and Chinese concepts, seems meaningful: A tonic is an agent that has the capability to restore and/or maintain the physiological functioning of an organ system, leading to the subjective feeling of well-being of the patient treated with it.

Schlüsselwörter

CAM · Pflanzenheilkunde · Pflanzliche Arznei- und Heilmittel · Phytotherapie · Tonikum

Zusammenfassung

In der traditionellen Medizin, insbesondere der CAM, hat das Konzept der (pflanzlichen) Tonika eine lange Tradition in den verschiedenen Medizinsystemen (z.B. traditionelle europäische Naturheilkunde (TEN); traditionelle chinesische Medizin (TCM)). Jedoch sind die Zuschreibungen, welche Funktion ein Tonikum hat, unterschiedlich; z.B. Stimulierung der Körperfunktionen, Stärkung einzelner Organfunktionen sowie Verbesserung der Adaptation und des Wohlbefindens. Auch wenn keine eindeutigen pharmakodynamischen und pharmakokinetischen Eigenschaften für eine allgemeingültige Definition von Tonika genannt werden können, so scheint folgende Definition, auch im transkulturellen Vergleich europäischer und chinesischer Konzepte, sinnvoll: Ein Tonikum ist eine Substanz mit der Fähigkeit, die physiologische Funktion eines Organsystems wieder herzustellen oder zu erhalten, was zum subjektiven Wohlbefinden des behandelten Patienten führt.

Introduction

The term ‘tonic’ is derived from the Greek word for tension: *tonos* (tonos). Many products are being marketed as so-called tonic or herbal tonic, and the concept of what is meant to be a tonic is often unclear. The designation ‘roborant’ is often used synonymously and is derived from Latin ‘robo-

rare’, which means ‘strengthen’. The definition of tonic and its desired effects found in medical dictionaries and other resources vary remarkably. In Emil Starkenstein’s opinion 70 years ago, agents that can eliminate a subjective feeling of illness or weakness that is not accompanied by objectively measurable organ malfunctions or a result of an earlier episode of such a malfunction should be called tonics. [1]

Table 1. Possible definitions of tonic

Year	Authors	Definition
1934	Starkenstein	An agent that ‘can eliminate a subjective feeling of illness or weakness that is not accompanied by objectively measurable organ malfunctions or a result of an earlier episode of such a malfunction.’ [1]
1984	Teeguarden	An agent ‘not specifically used to treat, nor even to prevent disease, but to fortify the body-mind, to strengthen the life functions, to encourage natural harmony, to enhance one’s adaptability, and as a result of this, to generate what the Chinese call “radiant health.”’ [6]
1993	Mowrey	An agent that ‘balances the biochemical and physiological events that comprise body systems. Tonics are bidirectional, capable of both increasing and decreasing the activity of body processes.’ [11]
1995	Stedman	‘A remedy purported to restore enfeebled function and promote vigor and a sense of well-being; qualified, according to the organ or system on which they are presumed to act, as cardiac, digestive, hematic, vascular, nervine, uterine, etc.’ [3]
1996	Bergner	‘A special food that nourishes, rather than a drug that stimulates. Tonics do not produce the subsequent “crash” that stimulants do. Many of the tonic herbs sedate even as they build energy.’ [9]
2000	Mills, Bone	‘A remedy with substantially supportive reputations. Some tonics are also classified as adaptogens, i.e. they appear to encourage the body to better adaptability under stress.’ [8]
2001	Alghabban	‘An agent used to stimulate the functions of the body or more generally to increase the patient’s feeling of well-being.’ [2]

Nowadays, some compare tonics to stimulants: ‘An agent used to stimulate the functions of the body or more generally to increase the patient’s feeling of well-being.’ [2] Others choose a more general approach to describe the properties of tonics: ‘A tonic is a remedy purported to restore enfeebled function and promote vigor and a sense of well-being; qualified, according to the organ or system on which it is presumed to act, as cardiac, digestive, hematic, vascular, nervine, uterine, etc.’ [3] (table 1).

The existence and importance of the therapeutic effects of tonics as a heterogeneous group of medicines are still debated. For many of the alleged tonics, no pharmacodynamic explanations have been found to support the effects that are often only subjectively measurable. The class of tonics is heterogeneous because they do not necessarily have common pharmacological properties. They affect different organ systems and have different points of action. What unites them is merely the principle of maintaining and restoring the physiological function of an organ system. Therefore, the effect of tonics cannot be proven for the group as a whole, but must be assessed individually for every single tonic. The tonics are a group of agents that fulfill the criteria to be called a tonic without regard to their exact pharmacodynamical or pharmacokinetic properties. The lack of a generally acknowledged definition of a tonic may lead to misunderstandings: e.g., although reports about Chinese ‘tonic wines for a long life, made from dinosaur bones’ [4] can still be found in popular literature, they do no justice to the actual meaning of tonics, as they have been successfully used in TCM for thousands of years – neither do advertisements in the Internet for ‘all-purpose tonics’, that ‘can be equally beneficial in the treatment of almost any illness.’ [5]

Ron Teeguarden, a Western translator of Chinese texts and Chinese herbalist, writes in his book ‘Chinese Tonic Herbs’ that ‘among the thousands of herbs used by the Chinese are a select few which are known as the “tonics”. These herbs are revered by all those who are aware of them because they enhance the life-force and increase longevity. Also called the “superior herbs”, the tonics may be taken safely for a long duration if desired to build and maintain health. The tonic herbs are not considered “medicinal” in the normal sense of the word. They are not specifically used to treat, or even to prevent disease. Instead, they are used to fortify the body-mind, to strengthen the life functions, to encourage “natural harmony”, to enhance one’s adaptability, and as a result of this to generate what the Chinese call “radiant health”.’ [6] Teeguarden emphasizes that tonics were not, and are not, used for healing purposes per se; but are used instead to assist, harmonize, and re-establish the natural order by encouraging natural processes and by enhancing ‘life force’. The tonics are therefore traditionally used to promote a dynamic equilibrium of the psycho-physical condition and to promote maximum health. [6]

From this point of view, tonics may be regarded as a preventive regimen rather than a cure for disease. The opinion, that the intention to prevent disease – instead of waiting for it to appear in order to cure it – should be a main objective of any modern healthcare system and is also shared by the World Health Organization (WHO) [7].

Simon Mills, director of the Plant Medicine CIC in UK, and Kerry Bone, principal of the Australian College of Phytotherapy in Warwick, argue that most clinical conditions in modern times can be seen as marked by degrees of debility. Low-grade viral or fungal infections, allergies, chronic inflam-

matory diseases, and stress problems are all marked by a failure to cope with or to defend them adequately. They further note that one perspective on this development is that modern medicine has so effectively neutered the acute battle, especially in the too frequent use of antibiotics and anti-inflammatory drugs, that most people in developed countries have never had to muster their defenses [8]. Modern medicine has mastered the cure of most acute medical conditions, but obviously has problems to cope with various chronic diseases. The use of tonics may prove to be of high value in their prevention.

Many of the concerns and prejudices against tonics seem to be products of a wrong comprehension of what a tonic is meant to be. A tonic is not simply a drug that ‘makes the body stronger’. It is meant to normalize and stabilize the physiological state of an organ system. This means that the function of the affected organ system is directed towards the optimal state of function in service of the whole body. An overstimulated organ system, as it is attained by the use of stimulants, may jeopardize the balance of the body as a whole. For example, a central nervous stimulant (e.g., ephedrine) may easily lead to exhaustion if the body cannot keep up with the overactive CNS [9]. This differentiation is also made in TCM. Paul Bergner, clinic director of the Rocky Mountain Center for Botanical Medicine in Boulder, Colorado, describes the opposing effects of stimulants and tonics on patients with the Chinese diagnosis of ‘chi deficiency’, a state of deficiency of basic vital energy, as follows: ‘The distinction between stimulants and tonics is important; many people with chi deficiency who medicate themselves with caffeine or other stimulants end up with less chi than they started out with. Taking a tonic is like putting money (chi) in the bank. Taking a stimulant is like withdrawing the money; at some point, your account becomes overdrawn. If you continue to spend chi without replenishing it, the consequence can be “energy bankruptcy” – severely depleted chi. A chi-building program, including tonic herbs and other lifestyle changes, is like starting a savings plan; if you’re in debt and overdrawn, it’s best to cut up your credit cards (stimulants) and start a more rational plan for saving’ [9]. In phytotherapy, Mills and Bone define tonics as ‘remedies with substantially supportive reputations. Some are also classified as adaptogens, i.e. they appear to encourage the body to better adaptability under stress.’ [8, 10] According to Daniel Mowrey, president of the American Phytotherapy Research Laboratory in Lehi, Utah, ‘a tonic is any substance that balances the biochemical and physiological events that comprise body systems.’ Moreover, ‘tonics do not overstimulate the body. They are bidirectional, capable of both increasing and decreasing the activity of body processes. Herbs whose action is bidirectional (or, sometimes, multidirectional) are called tonics.’ [11] This concept of bidirectionality is also implied when Bergner proclaims that ‘the general effect of ginseng, in low doses, is to increase alertness while relaxing emotional ten-

sion’ [9] as well as when Teeguarden emphasizes that tonics are used ‘to assist, harmonize and re-establish the natural order by encouraging natural processes.’ [6]

These bidirectional or harmonizing properties as well as the often only subtle effects may cause the apparent difficulties to prove the efficacy of tonics in laboratory experiments as well as in clinical trials. Thus, often the actual effective agent in a tonic herb cannot be discovered. In addition to this and according to the physician Rudolf Weiss and the principles of phytotherapy, with all plant remedies, one very often has a comprehensive complex of active principles, with individual components interacting with others, so that only the complex as a whole will produce the therapeutic action [12]. According to Mowrey, ‘bidirectionality presupposes at least two conditions. One, bidirectional agents, or tonics, must contain opposing groups of constituents, each group capable of sending a different signal, of facilitating reactions in the body opposite (or complementary) to those promoted by the other group. Two, the body must be capable of recognizing and utilizing the correct group of constituents required to restore and/or maintain functional balance or homeostasis.’ [11] In addition, tonic herbs, unlike stimulants, often do not have instant effects. They should be seen as special foods that nourish, rather than drugs that stimulate. This can make it hard to prove any measurable effects other than the patient’s subjectively improved feeling of well-being. On the other hand, they do not produce the subsequent ‘crash’ that stimulants do [9].

Another group of substances, besides the stimulants, that are often confused with tonics are the ‘bitters’ or ‘tonic bitters’. Bitters may be tonics, yet not all tonics are bitters. These herbs contain bitter principles and mainly increase the secretion of digestive juices, especially in the stomach, via primary stimulation of the bitter receptors in the taste buds at the base of the tongue and secondary gastrin secretion, which occurs when the bitter principles reach the stomach along with the food. Additionally, bitters may have an antidepressant and constitutional therapeutic potential and can be used against fatigue, exhaustion, and stress [13–15]. An interesting finding in laboratory experiments with animals as well as humans was that bitters do not have any additional effects in healthy subjects with a normal appetite and normal reflex secretion. Bitters must be dosed high enough to achieve adequate effects, yet overdose may induce opposite effects [16]. This may also be perceived as an example for the bidirectionally active qualities that tonics are claimed to possess. Table 1 provides an overview of different definitions of tonic that can be found in the literature.

The authors’ suggested definition – derived from the comparable core principle of the definitions above – is the following: A tonic is an agent that has the capability to restore and/or maintain the physiological functioning of an organ system, leading to the subjective feeling of well-being of the patient treated with it.

Historical Aspects of Tonics

The Hellenic methodists in the first century B.C. proclaimed that all maladies are a consequence of either a state of pathologically increased physical tension ('status strictus'), a state of lacking tension ('status laxus'), or a combination of both [17, 18]. In their opinion, the aim of therapy therefore should be to restore balance through a tonic diet and exercises.

In the 18th century, the German physician Friedrich Hofmann (1660–1743) believed that health is the result of a balanced 'tonus', and illness occurs if this physiological 'tonus' cannot be maintained. In accordance to this theory, he was the first to conjoin 'roborants and tonics' as a distinctive group of drugs. Samuel Schaarschmitt was most probably influenced by Hofmann, when in 1755 he wrote the paragraph about 'Confortantia' in his 'Therapia Generalis' [19]: 'Wenn die festen Teile ihre gehörige Spannung nicht haben, sondern erschlappet sind, so heisst der Zustand Atonia und die Mittel, welche ihre natürliche Spannung wieder herstellen, werden Confortantia genannt. Ihre Wirkung besteht darin, dass sie die festen Teile zur Zusammenziehung anreizen; deswegen heissen sie auch Stimulantia. Geschieht die Zusammenziehung dergestalt, dass sie nicht stärker wird als die Spannung natürlicher Weise sein muss, so pflegt man dergleichen Arzneien Roborantia zu nennen, ist sie etwas stärker, so werden sie Adstringentia genannt.' (Translation by the first author of this essay: 'When the solid parts do not have their proper tension and are loosened, this state is called *atonia* and remedies that restore their proper tension are called *confortantia*. Their effect is to induce a tightening of the solid parts. For that reason they are also called *stimulantia*. If this tightening leads to a tension no stronger than the natural state, the remedies are called *roborantia*, if it is stronger, they are called *adstringentia*.)' Herewith, Schaarschmitt describes tonics as agents that restore physiological tension and opposes them to astringents that cause an excess of tension. However, he unfortunately unites them in the group of stimulants, which might be due to the influence of Brownianism at that time. However, the idea of tonics having stimulating effects can still be found in Kampo Medicine (KM) today.

In 1934, Starkenstein proclaimed that the development of better techniques of drug analysis, that allow to determine the exact point of action for medicines, will rule all those substances out of the group of tonics and roborants, that diminish the subjective feeling of illness by proven to have one single point of action. As mentioned above, in his opinion, only agents that can eliminate a subjective feeling of illness or weakness that is not accompanied by objectively measurable organ malfunctions or a result of an earlier episode of such a malfunction should be called tonics [1].

Tonics are claimed to have been used for thousands of years in TCM [6]. In the following, only aspects of the Chinese medical model that are important for the comprehension of the concept of tonic are circumscribed.

Mills and Bone emphasize that the Chinese point of view has been fundamentally different from that in the West since the time of Aristotle. They claim, that 'in Chinese thought, everything moves. Events are automatically described by their transient qualities in relation to other events and are manifestations of energies in the ways that the West understood only after Einstein. The generic term for these energies is *qi*.' [8] According to Bergner, apart from the use of tonics to prevent ailments and disease by encouraging natural harmony of the body and enhancing one's adaptability, TCM distinguishes 4 types of deficiencies that tonic herbs may be prescribed for: *chi/qi* (energy), *xue* (blood), *yang* (propulsive), and *yin* (storing) deficiencies. (In this context, it must be emphasized that the meaning of the principles of *yin* and *yang* is far more extensive than it is suggested by the simplified translation of 'storing' for the solid *yin* organs and 'propulsive' for the hollow *yang* organs. This simplified translation merely intends to help to differentiate the general properties and functions of *yin* and *yang* organs and their respective tonics.) *Chi* and blood deficiencies are closely related. *Chi* from spleen and lung are believed to build the blood, but sufficient blood is necessary for *chi* to function. Therefore signs of these deficiencies often coexist and they are often treated with both *chi* and blood tonics. Deficient *chi* can become more severe and progress to a condition called deficient *yang*. Its main manifestation, in addition to symptoms of deficient *chi*, is signs of cold. Deficient blood involves a deficiency in the volume or quality of the blood. A more serious, related condition is deficient *yin*, a deficiency of body fluids in general. Since the fluids are believed to moisten and to cool the body, a *yin* deficiency will result in heat signs. [9]

Robert Svoboda, an author and holder of a permission to practice ayurvedic medicine issued by the Indian government, and Arnie Lade, who studied TCM in Beijing, emphasize the importance of knowledge of the relations between the organs (*zang fu*) and the different symptoms manifested physically, emotionally as well as mentally. In this context, it is important to remember that Chinese medicine does not describe organs in terms of their anatomical structures as we do, but as functions. Therefore, it can be confusing that Western names are commonly used synonymous to the Chinese concept of organs. Twelve organs are described, 10 of them are of special importance: 5 *yin* and 5 *yang* organs. The *yin* organs are the 'solid' liver, heart, spleen, lungs, and kidneys. The *yang* organs are the 'hollow' gallbladder, small intestine, stomach, colon, and urinary bladder. The remaining 2 organs are the pericardium – protecting the heart – and the triple burner that has no corresponding organ in Western medicine. The triple burner is the functional relationship between all the organs that regulate water balance. The *yin* organs are solid and have mainly storing and accumulating qualities, whereas the *yang* organs are hollow, propulsive, and mainly connected with excretion. The organs are regarded as pairs of each a *yin* and a *yang* organ, connected through inner and outer meridians and

corresponding to one of the 5 elements: wood (liver, gallbladder), fire (heart, small intestine), earth (spleen, stomach), metal (lung, large intestine), and water (kidney, urinary bladder) [20]. In Chinese medicine, tonics are herbs that – over thousands of years – have gradually been discovered to be useful in strengthening the life functions and maintaining the balance and adaptability of this complex system [6].

It remains to be seen which role herbal tonics – no matter from which traditional medical system (TCM, TEN, KM) [13, 21–23] – might gain in Western achievement-oriented societies, where individuals tend to regulate organ systems (e.g., by

drugs or neuroenhancers) [24, 25] to increase their performance [26, 27]. Whether the hypothesis of mitochondrial ATP generation can be a solid pharmacological basis needs to be examined as well [23].

Disclosure Statement

The authors declare that there is no conflict of interest regarding this paper.

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